INDUSTRIAL ENERGY ASSESSMENTS AT ARMY INSTALLATIONS

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PURPOSE

- Introduce energy assessments and a protocol to use when evaluating Army industrial facilities
- Present energy and efficiency projects that are effective in industrial facilities

INDUSTRIAL ENERGY USE

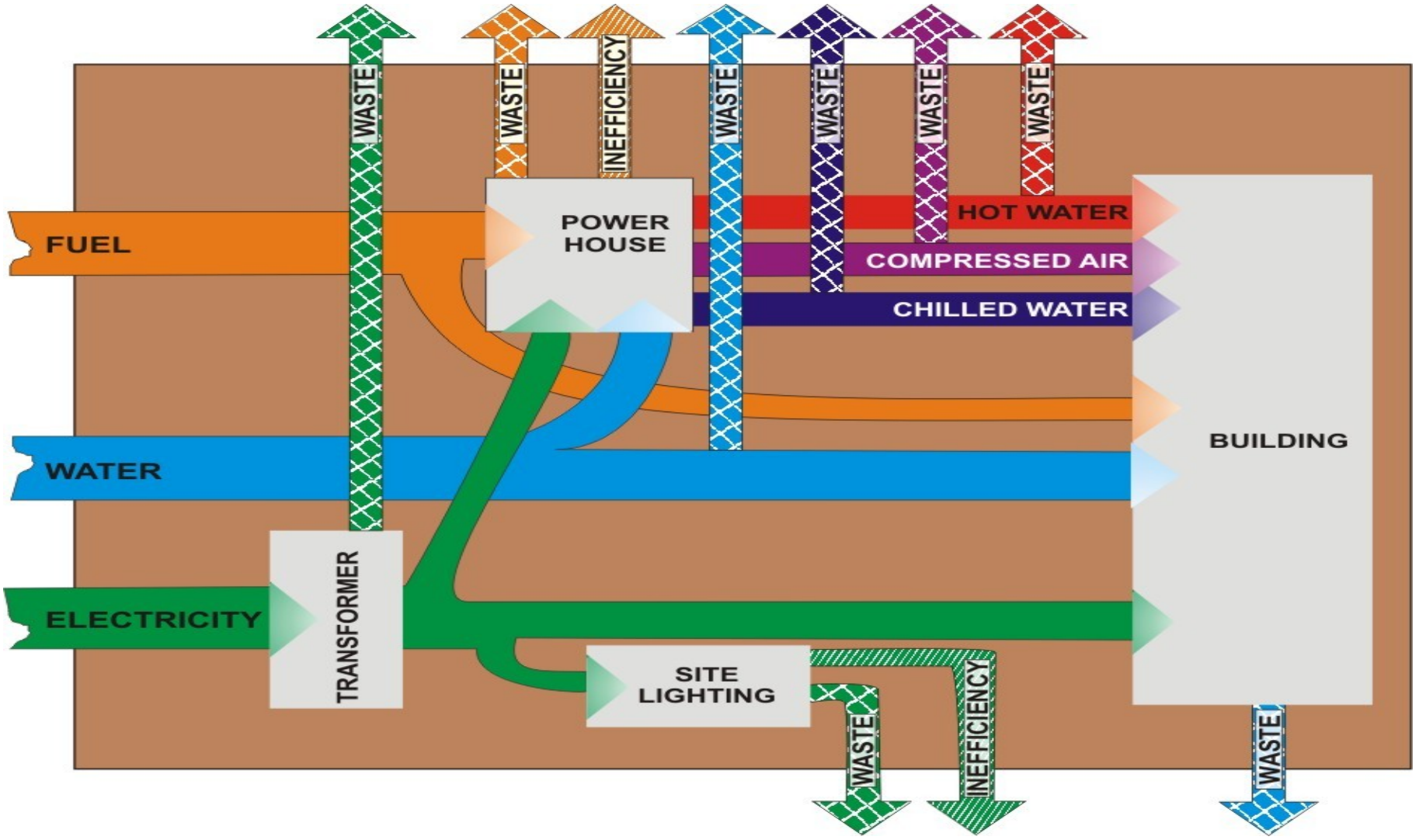
- Industrial facilities use approximately 25% of the energy consumed in the USA
- This economic sector has a high energy intensity
- Energy intensity is declining due to improvements in efficiency and slow growth of the most intensive industry types

INDUSTRIAL PROCESS AND ENERGY OPTIMIZATION ASSESSMENTS

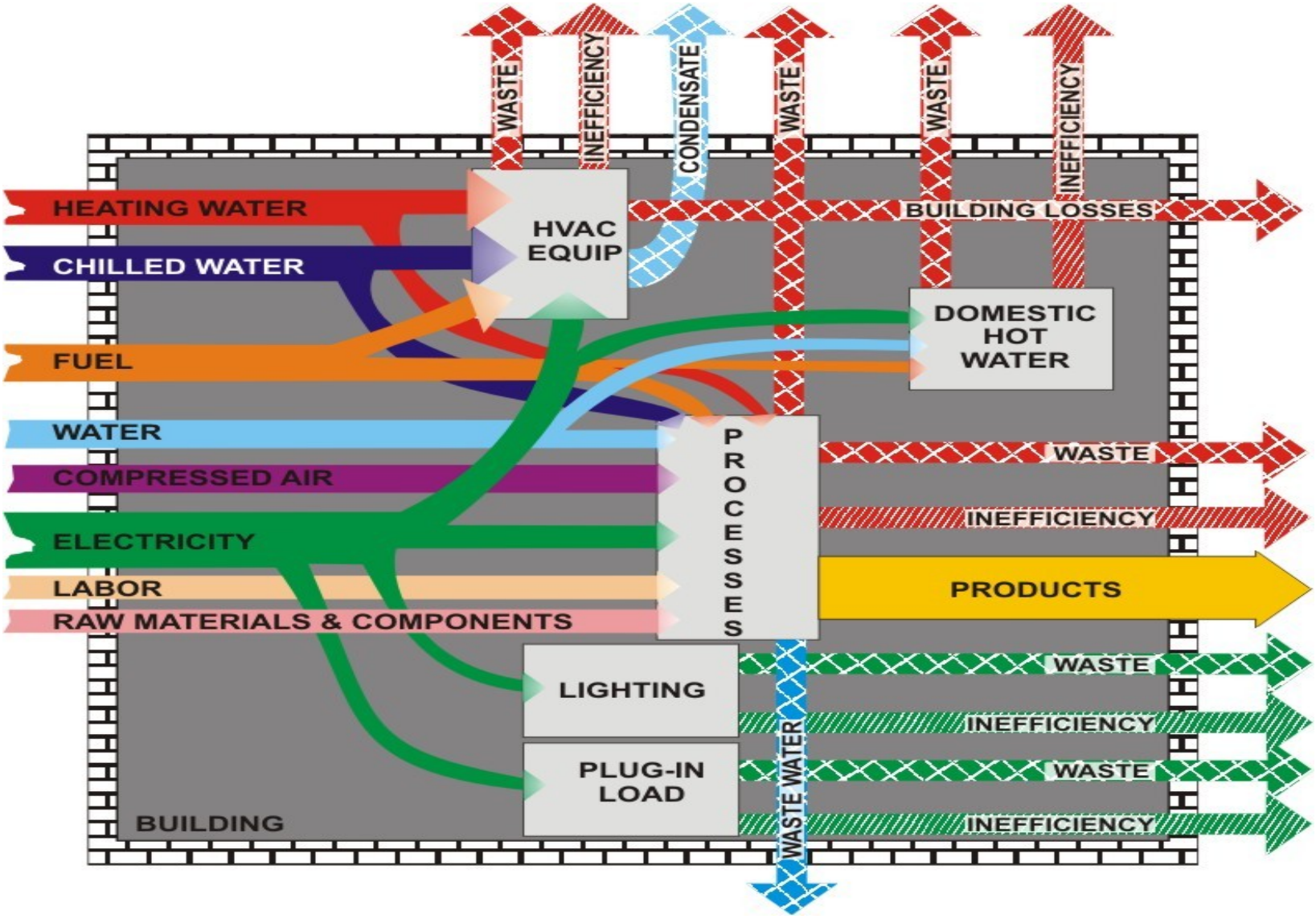
Assessment Goals

- Eliminate waste
  - Poor maintenance
  - Improper system operation
  - Waste recovery
- Improve efficiency
  - Replace existing
  - System upgrade

SITE OPTIMIZATION



BUILDING OPTIMIZATION



INDUSTRIAL PROCESS AND ENERGY OPTIMIZATION ASSESSMENTS

Interactive approach

- Three levels of analysis
  - Initial screening
  - Comprehensive evaluation of selected opportunity
  - System design, implementation and result measurement
- Participation with plant management
  - Solicit production improvement ideas
  - Seek out manufacturing problems

KEY TO SUCCESSFUL ARMY INDUSTRIAL ASSESSMENTS

Need to consider labor cost reduction and increased production output in addition to energy savings.

- 1 million Btu saved = $5 to $15
- 1 million watt hours = $5 to $10
- 1 man hour = $ 40 to $80
- 1% production output improvement = less overtime, smaller fleet of equipment, better utilization of space

POTENTIAL INDUSTRIAL PROJECTS

- Industrial Processes
- General Systems
  - HVAC
  - Lighting
  - Motors
  - Compressed air
  - Boilers
  - Chillers

INDUSTRIAL PROCESS PROJECTS

- Painting Operations
  - Reduced air flow when not painti
  - Match oven with painting produc
  - Adequate paint preparation area
  - Recycle oven air
  - Deliver properly conditioned air
  - Balance supply air with exhaust
  - Enhance paint booth tightness

INDUSTRIAL PROCESS PROJECTS CONTINUED

- Welding operations
  - Variable flow exhaust
  - Flexible and easy to use hoods
  - Close capture exhaus

INDUSTRIAL PROCESS PROJECTS CONTINUED

- Heat treat operations
  - Heat recovery
  - Natural ventilation
  - Close capture exhaust
  - Production planning

INDUSTRIAL PROCESS PROJECTS CONTINUED

- Plating operations
  - Use tank covers to reduce exhaust

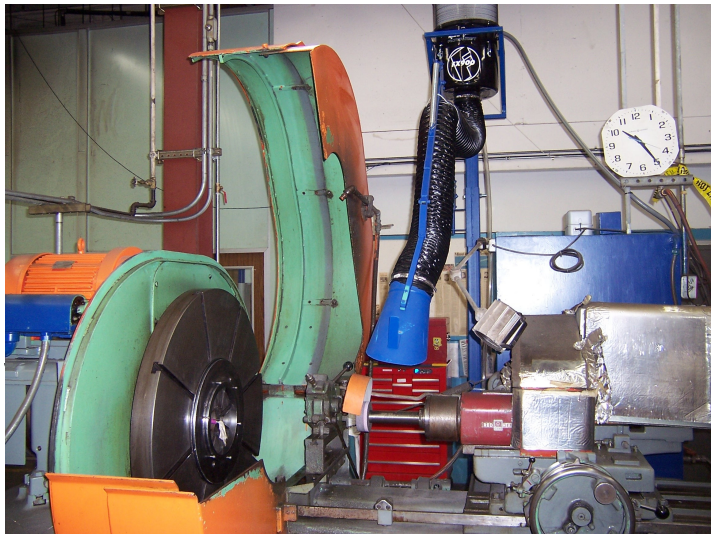
  - Reduce exhaust air flows where possible
  - Production planning

INDUSTRIAL PROCESS PROJECTS CONTINUED

- Part machining & Assembly
  - Use enclosures
  - Avoid stressful environments
    - Improved efficiency
    - Reduced scrap
    - Break reduction

INDUSTRIAL GENERAL SYSTEM PROJECTS

- HVAC
  - High efficiency components
  - Heat recovery
  - Improved controls
  - Local exhaust
  - Control building air flo



INDUSTRIAL GENERAL SYSTEM PROJECTS CONTINUED

- HVAC
  - Adjust conditions during unoccupied times
  - Use evaporative coolers for heat relief
  - Use direct fired gas heating
  - Consider thermal storage systems

INDUSTRIAL BUILDINGS PROJECTS

- Building design goal – to effectively house processes that produce products.
- Building space is programmed to maximize production aided by material handling systems.
- Provide vestibules
- Seal openings
- Utilize cool roofs

Questions?